State of California—Health and Human Services Agency
California Department of Public Health

KAREN L. SMITH, MD, MPH
Director and State Public Health Officer

EDMUND G. BROWN JR.
Governor

June 6, 2018

Dear Ms. Lancaster and Mr. Robinson,

Thank you for taking the time to discuss the results of the soil sampling in your backyard with us on May 17 and 18, 2018. We appreciate your sharing of health and exposure concerns and how you used your backyard. This information helps us determine if you could have been exposed to Polychlorinated Biphenyls (PCBs) in your backyard soil. We try to give you the best information possible, so you can make informed decisions about your health.

What is the California Department of Public Health doing in Riverside?

The California Department of Public Health (CDPH) is investigating how the PCB contamination at Riverside Agricultural Park (Ag Park) could have affected the surrounding neighborhood. To do this, we worked with community members and organizations, the City of Riverside, the California Department of Toxic Substances Control (DTSC), the US Environmental Protection Agency (USEPA), and the federal Agency for Toxic Substances and Disease Registry (ATSDR).

Sampling your backyard soil for PCBs

DTSC collected soil from 25 residential parcels, Rutland Park and a City-owned Right-of-Way. Your parcel was included in the sampling plan, which we helped DTSC design. With your permission, DTSC sampled your front and backyard in July 2017.

How much PCBs are in your soil?

The highest concentration was found in your backyard, but they found very low or no PCBs in your front yard, or at the neighboring parcels. The highest concentration found was 2.14 milligram PCBs per kilogram of soil or mg/kg. This is about 10 times higher than the screening level of 0.19 mg/kg that we use to determine if we need to look further. DTSC uses a similar screening level of 0.22 mg/kg. Although the concentrations found in your backyard do not represent an immediate concern, we agreed with DTSC's decision to collect more soil samples.

In March 2018, with your permission, DTSC collected 55 surface soil samples and two samples at 2.5 ft. depth in your backyard. 48 surface samples were above the screening level and the highest concentration found was 2.79 mg/kg. Overall, the highest concentrations were found in the eastern half of the backyard. The two subsurface samples had very low concentrations or no PCBs. It is our understanding that DTSC discussed this information with you in April 2018, and you indicated to us that you do not use your backyard anymore.

Environmental Health Investigations Branch
850 Marina Bay Parkway Building P 3rd Floor
(510) 620 3620 • (916) 620 3620 FAX
Internet Address: www.cdph.ca.gov

What is the health risk from the PCBs in the backyard?

We estimated potential cancer risks from touching or accidentally swallowing soil while doing normal activities such as playing, gardening, and spending time in the backyard:

- For children, if 1 million were exposed, we would expect about 10 additional cancer cases.
- For adults, if 1 million were exposed, we would expect about 3 additional cancer cases.

These are low cancer risks, but they are above the commonly accepted threshold of 1 additional cancer case in 1 million people similarly exposed.

What will happen next?

DTSC and the City of Riverside are working together to remove the contaminated soil from your backyard and we agree with this decision. We are also making recommendations to the City and DTSC to have your house dust tested for PCBs, based on how you used your backyard in the past (childcare facility) and the PCB concentrations found.

How did CDPH calculate these health risks?

To estimate the health risks, we used the following assumptions:

- You lived in your home for 33 years (since 1995) and your children lived there from birth to 21 years;
- The concentration of PCBs in soil to represent the entire backyard is 1.852 mg/kg;
- Everyone was exposed to backyard soil every day;
- Children swallowed about 200 mg of soil per day, were barefoot all the time, and wore shorts and T-Shirts year-round;
- Adults swallowed about 100 mg of soil per day.

These assumptions overestimate the exposures to PCBs. For instance, most children and adults will swallow less soil per day. Likewise, there may be days when they did not enter the backyard, or children wore shoes and long pants for part of the year. Given that we used these health protective assumptions, the cancer risks from touching and swallowing soil are likely lower than our estimates.

What are the limitations of this evaluation?

- We do not know the PCB concentrations in soil in the past, or when and how your backyard was contaminated. It is possible that contaminated fill, topsoil, or sod was brought in when the house was built, or that the contamination occurred sometime afterwards. In our evaluation, we used the current concentrations.
- The non-cancer health effects are difficult to evaluate since the type of PCBs found in your backyard (Aroclor 1248) are not the same as the PCBs used to calculate the screening level for non-cancer effects (Aroclor 1254). The non-cancer screening level for Aroclor 1254 is the

amount of PCBs that is safe for children and adults to swallow every day, without developing health effects. In our calculations, children under 6 years old swallowed about the same amount of PCBs as this non-cancer screening level. Older children and adults swallowed less. Again, these calculations are based on health protective assumptions. We do not expect non-cancer health effects from this exposure.

- We do not know if you had additional exposures to PCBs. Most of us have PCBs in our bodies from our diet, especially from sports fish, commercial fish, fatty meats and dairy products, but also from contact with old electrical equipment, transformers, capacitors, fluorescent lamps, etc. Also, PCBs can be found in house dust from other sources than contaminated soil.
- We do not know how much dust a child or adult would inhale during their normal activities in the backyard. The dust in the air would be a mixture of the surface soil from the backyard and windblown dust, depending on the activity. We assume that only small amounts of PCBs will enter the body this way.

Evaluation of your health and exposure concerns

Health concerns

You told us that you were concerned about your children's exposures to PCB from the backyard soil, and whether benign tumors or a lump in the chest could be related to this PCB exposure. Diseases that take a long time to develop, such as tumors or cancer, are particularly difficult to explain. This is because many factors can play a role in their development including: individual medical history, genetic heritage, and exposures to chemical, physical, and biological agents. Because of this, we cannot say if exposures to PCBs caused a specific disease or condition and we cannot give medical advice. However, we recommend that you contact your physician with these health concerns and review the Patient Information Package we sent you.

Tracking dirt into the home/house dust

Given that your home was a childcare facility for many years, and that children and staff spent a lot of time in the backyard, it is likely that soil was tracked into your home over time. You indicated that a portion of the carpet was replaced recently, but we do not know at which point PCBs were brought into the backyard. We recommend that your house dust be tested for PCBs. We also recommend installing doormats in front of each entrance, and/or removing shoes before entering to avoid tracking in dirt. Finally, if you have pets, clean their feet and fur before they come inside.

Eating homegrown vegetables and fruit

The most likely exposure to PCBs from vegetables/fruit comes from soil that sticks to the vegetable surface (root, leaf, or fruits/tomato). PCBs are bound to soil and are not easily absorbed by the roots. There is very little accumulation of PCBs in tomatoes or other fruit. Unless you ate a large amount of homegrown vegetables and fruits, there is little concern for PCB exposure from your garden. You should always wash vegetables and fruit to remove soil

and dust, before eating. Since the roots don't take up PCBs, it is unlikely that fruit trees died from PCBs in soil.

Other exposures to PCBs:

You indicated that in 2003 or 2004 your blood was analyzed for PCBs, due to possible exposures during your childhood. Your blood sample came out "high", but no PCBs were found in your siblings' blood samples. PCBs can stay in our bodies for many years, and older people usually have more PCBs in their bodies than younger people. We cannot say what the possible sources of the PCBs in your blood in 2003/2004 were. For example, we do not know the PCB concentrations in your backyard or house dust at that time, nor do we know how much PCBs were in your diet. We recommend that you have your blood tested again and avoid exposures to PCBs, for example from contact with old electrical equipment, transformers, capacitors, or fluorescent lamps. Sports fish and fatty meats also contain PCBs. While dairy products and commercial fish are healthy, it is known that they may contain PCBs as well.

CDPH's recommendations

1. We recommend that DTSC and the City of Riverside work together to
   a) remove the contaminated soil from your backyard
   b) test house dust in your home for PCBs.
2. We recommend that you contact your physician with any health concerns you have, and to have your blood tested for PCBs. We sent you six copies of the "Patient Information Package" with information for you and your health care provider. We can also connect you to specialists trained in environmental medicine, or you can contact the University of California at Irvine Center for Occupational and Environmental Health Clinic at (949) 824-8685, either by yourself or with a referral from your health care provider.
3. We recommend that you install doormats to avoid tracking in backyard soil, and/or remove shoes before entering, and clean pets before they come inside.
4. We recommend that you review the information on PCBs that we have included in this letter.

Next steps

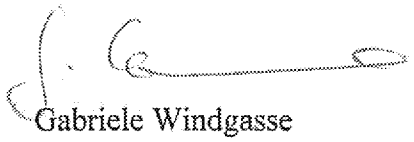
We will share this letter with DTSC and the City of Riverside, requesting that they treat this as confidential information, and that they follow up on our recommendations.

We are also writing an evaluation of the neighborhood sampling that occurred in July 2017 and will publish this "Health Consultation" for public comment. However, this document will not identify individual parcels sampled, and will not include the March 2018 sampling of your backyard. In addition, we are preparing a Health Consultation on potential past exposures to people spending time on the Ag Park itself, which will also be published for public comment.

We hope that the information in this letter is helpful. If you have any questions regarding our evaluation, recommendations, or your health and exposure concerns, please do not hesitate to contact me. I will be in the Los Angeles Area on June 11, 12 and 13, and I would be happy to

meet with you to discuss this letter, and any health or exposure concerns that you may have. Please contact me to schedule a time to meet if you are interested.

Sincerely



Gabriele Windgasse

Gabriele Windgasse DrPH, MS
Chief, Site Assessment Section
Environmental Health Investigations Branch
California Department of Public Health
850 Marina Bay Parkway
Richmond, CA 94804
Tel: 510 620 3610
Gabriele.Windgasse@cdph.ca.gov

Disclaimer

This report was supported in part by funds provided through a cooperative agreement with the Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services. The findings and conclusions in these reports are those of the author(s) and do not necessarily represent the views of the Agency for Toxic Substances and Disease Registry or the U.S. Department of Health and Human Services. This document has not been revised or edited to conform to agency standards.

Attachment: ATSDR Factsheet on PCBs

Polychlorinated Biphenyls - ToxFAQs™

This fact sheet answers the most frequently asked health questions (FAQs) about polychlorinated biphenyls. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Polychlorinated biphenyls (PCBs) are a mixture of individual chemicals which are no longer produced in the United States, but are still found in the environment. Health effects that have been associated with exposure to PCBs include acne-like skin conditions in adults and neurobehavioral and immunological changes in children. PCBs are known to cause cancer in animals. PCBs have been found in at least 500 of the 1,598 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What are polychlorinated biphenyls?

Polychlorinated biphenyls are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor.

PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors, and old microscope and hydraulic oils.

What happens to PCBs when they enter the environment?

- PCBs entered the air, water, and soil during their manufacture, use, and disposal; from accidental spills and leaks during their transport; and from leaks or fires in products containing PCBs.
- PCBs can still be released to the environment from hazardous waste sites; illegal or improper disposal of industrial wastes and consumer products; leaks from old electrical transformers containing PCBs; and burning of some wastes in incinerators.
- PCBs do not readily break down in the environment and thus may remain there for very long periods of time. PCBs can travel long distances in the air and be deposited in areas far away from where they were released. In water, a small amount of PCBs may remain dissolved, but most stick to organic particles and bottom sediments. PCBs also bind strongly to soil.
- PCBs are taken up by small organisms and fish in water. They are also taken up by other animals that eat these aquatic animals as food. PCBs accumulate in fish and marine mammals, reaching levels that may be many thousands of times higher than in water.

How might I be exposed to PCBs?

- Using old fluorescent lighting fixtures and electrical devices and appliances, such as television sets and refrigerators, that were made 30 or more years ago. These items may leak small amounts of PCBs into the air when they get hot during operation, and could be a source of skin exposure.
- Eating contaminated food. The main dietary sources of PCBs are fish (especially sportfish caught in contaminated lakes or rivers), meat, and dairy products.
- Breathing air near hazardous waste sites and drinking contaminated well water.
- In the workplace during repair and maintenance of PCB transformers; accidents, fires or spills involving transformers, fluorescent lights, and other old electrical devices; and disposal of PCB materials.

How can PCBs affect my health?

The most commonly observed health effects in people exposed to large amounts of PCBs are skin conditions such as acne and rashes. Studies in exposed workers have shown changes in blood and urine that may indicate liver damage. PCB exposures in the general population are not likely to result in skin and liver effects. Most of the studies of health effects of PCBs in the general population examined children of mothers who were exposed to PCBs.

Animals that ate food containing large amounts of PCBs for short periods of time had mild liver damage and some died. Animals that ate smaller amounts of PCBs in food over

several weeks or months developed various kinds of health effects, including anemia; acne-like skin conditions; and liver, stomach, and thyroid gland injuries. Other effects of PCBs in animals include changes in the immune system, behavioral alterations, and impaired reproduction. PCBs are not known to cause birth defects.

How likely are PCBs to cause cancer?

Few studies of workers indicate that PCBs were associated with certain kinds of cancer in humans, such as cancer of the liver and biliary tract. Rats that ate food containing high levels of PCBs for two years developed liver cancer. The Department of Health and Human Services (DHHS) has concluded that PCBs may reasonably be anticipated to be carcinogens. PCBs have been classified as probably carcinogenic, and carcinogenic to humans (group 1) by the Environmental Protection Agency (EPA) and International Agency for Research on Cancer (IARC), respectively.

How can PCBs affect children?

Women who were exposed to relatively high levels of PCBs in the workplace or ate large amounts of fish contaminated with PCBs had babies that weighed slightly less than babies from women who did not have these exposures. Babies born to women who ate PCB-contaminated fish also showed abnormal responses in tests of infant behavior. Some of these behaviors, such as problems with motor skills and a decrease in short-term memory, lasted for several years. Other studies suggest that the immune system was affected in children born to and nursed by mothers exposed to increased levels of PCBs. There are no reports of structural birth defects caused by exposure to PCBs or of health effects of PCBs in older children. The most likely way infants will be exposed to PCBs is from breast milk. Transplacental transfers of PCBs were also reported in most cases, the benefits of breast-feeding outweigh any risks from exposure to PCBs in mother's milk.

How can families reduce the risks of exposure to PCBs?

- You and your children may be exposed to PCBs by eating fish or wildlife caught from contaminated locations. Certain states, Native American tribes, and U.S. territories have issued advisories to warn people about PCB-contaminated fish and fish-eating wildlife. You can reduce your family's exposure to PCBs by obeying these advisories.
- Children should be told not play with old appliances, electrical equipment, or transformers, since they may contain PCBs.
- Children should be discouraged from playing in the dirt near hazardous waste sites and in areas where there was a transformer fire. Children should also be discouraged from eating dirt and putting dirty hands, toys or other objects in their mouths, and should wash hands frequently.
- If you are exposed to PCBs in the workplace it is possible to carry them home on your clothes, body, or tools. If this is the case, you should shower and change clothing before leaving work, and your work clothes should be kept separate from other clothes and laundered separately.

Is there a medical test to show whether I've been exposed to PCBs?

Tests exist to measure levels of PCBs in your blood, body fat, and breast milk, but these are not routinely conducted. Most people normally have low levels of PCBs in their body because nearly everyone has been environmentally exposed to PCBs. The tests can show if your PCB levels are elevated, which would indicate past exposure to above-normal levels of PCBs, but cannot determine when or how long you were exposed or whether you will develop health effects.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 0.0005 milligrams of PCBs per liter of drinking water (0.0005 mg/L). Discharges, spills or accidental releases of 1 pound or more of PCBs into the environment must be reported to the EPA. The Food and Drug Administration (FDA) requires that infant foods, eggs, milk and other dairy products, fish and shellfish, poultry and red meat contain no more than 0.2-3 parts of PCBs per million parts (0.2-3 ppm) of food. Many states have established fish and wildlife consumption advisories for PCBs.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological profile for polychlorinated biphenyls (PCBs). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.